UNIVERSITI SAINS MALAYSIA

Second Semester Examination
2014/2015 Academic Session

June 2015

CIT546 – Applied Informatics
[Informatik Gunaan]

Duration : 2 hours
[Masa : 2 jam]

INSTRUCTIONS TO CANDIDATE:
[ARAHAN KEPADA CALON:]

- Please ensure that this examination paper contains **FOUR** questions in **SEVEN** printed pages before you begin the examination.

  *[Sila pastikan bahawa kertas peperiksaan ini mengandungi **EMPAT** soalan di dalam **TUJUH** muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]*

- Answer **ALL** questions.

  *[Jawab **SEMUA** soalan.]*

- You may answer the questions either in English or in Bahasa Malaysia.

  [Anda dibenarkan menjawab soalan sama ada dalam bahasa Inggeris atau bahasa Malaysia.]

- In the event of any discrepancies, the English version shall be used.

  [Sekiranya terdapat sebarang percanggahan pada soalan peperiksaan, versi bahasa Inggeris hendaklah diguna pakai.]

1. (a) Wikipedia defines Informatics as "the science of computer information systems" in the Informatics entry but no unique entry for Applied Informatics.

(i) Do you agree with its definition of Informatics? Why?

(30/100)

(ii) If you were to initiate an entry for Applied Informatics, how would you define and describe the field?

(35/100)

(b) Informatics professionals are known as informaticians. What kind of work do informaticians do? Explain your answer in the context of what they do "in" or "for" **two** (**2**) of the following areas:

- Business
- Community
- Health

(35/100)

2. (a) Many believe Big Data is a brand new phenomenon and the volume is ginormous! How about you? How would you describe Big Data? Explain using an example.

(40/100)

(b) The Software Engineering Code of Ethics and Professional Conduct (SECEPP) is one of the Code of Conducts (CoCs) which serves to guide informatics professionals and informaticians in "self-regulation" and accountable decision-making. *Acme Co. vs. ERP Systems Integrators* case below is one of the cases where the Code is used to resolve conflicts. Consider the case.

"Acme Co. received a directive from its parent corporation mandating replacement of its legacy pay and personnel systems with a specific ERP software package designed to standardize payroll and personnel processing enterprise-wide. Upon the vendor's "referred specialist" recommendation, Acme Co. contracted with ERP Systems Integrators to implement the new system and convert its legacy data for $1 million.

The contracted timeline was six months, beginning in July and wrapping up with a "big bang" conversion at the end of December. The year-end conversion failed, allegedly due to ERP Systems Integrators' poor data migration practices, and Acme Co. had to run the old and new systems in parallel—a complex and expensive situation that it had carefully planned to avoid and that ERP Systems Integrators had assured them would not occur. When the conversion was pushed into April of the following year, Acme Co. slowed and then ceased paying ERP Systems Integrators' invoices. In July, ERP Systems Integrators pulled its implementation team and Acme Co. initiated arbitration.

Most IT projects are governed by contracts that assign responsibilities to each party and provide specific remedies for delayed implementation or project failure. Such contracts require the parties to submit to private, binding arbitration to resolve disputes. (The arbitration) process slightly differs from civil litigation in a court of law. However, the use of CoCs applies equally to both settings.

Almost a year passed before the arbitration hearing. Meanwhile, Acme Co. and ERP Systems Integrators deposed witnesses, and experts scrutinized sales materials, project artifacts (e-mails, status reports, project plans, and so on), contract documents, application software, migration tools, and contents of the shared-drive implementation environment."

Cited from: P. Aiken, R.M. Stanley, J. Billings, L. Anderson (2010), "Using Codes of Conduct to Resolve Legal Disputes"*, IEEE Computer,* Vol. 43, NO. 4, pp. 29-34.

(i) What are **three** (**3**) key disputed issues to be resolved?

(30/100)

(ii) What was the decision arrived by the arbitration panel? Do you agree with them, why?

(15/100)

(iii) What was the impact of this case to IT profession and IT development/ vendor community?

(15/100)

3. (a) Compare information management to knowledge management.

(30/100)

(b) How do you transform an information management system into knowledge management system? Relevant example of an informatics artefact/system in the field of your choice (Business Informatics, Social Informatics, Biomedical Informatics, Ecoinformatics or Geoinformatics) should be included in your discussion.

(40/100)

(c) Identify at least **three (3)** challenges that you may face in carrying out the transformation in (b). Briefly discuss each of them.

(30/100)

4. Frank Briggs was a bright young PhD scientist with a patent on a new algorithm for monitoring brainwave activity and predicting the early onset of a stroke. He was convinced of the value of his idea and wanted to commercialise it. He decided to sell his car, borrowed money from family and signed up a large loan to kick start his new venture. However, Frank went bankrupt despite having a prototype which doctors he showed it to were impressed.

   (a) What could have gone wrong? Discuss based on the perspective of managing innovation process.

   (30/100)

   (b) Suggest how he could have avoided making the same mistake. Discuss based on the perspective of managing innovation process.

   (30/100)

   (c) What is the suitable business model pattern that Frank can adopt to start his new venture? Discuss based on the business model pattern by Alex Osterwalder.

   (40/100)

1. (a) Wikipedia mentakrifkan Informatik sebagai "sains sistem maklumat komputer" dalam entri Informatik tetapi tiada kemasukan yang unik untuk Informatik Gunaan.

(i) Setujukah anda dengan takrifan tersebut? Kenapa?

(30/100)

(ii) Jika anda memulakan entri untuk Informatik Gunaan, bagaimanakah akan anda takrif dan huraikan bidang tersebut?

(35/100)

(b) Ahli profesional informatik dikenali sebagai juruinformatik. Apakah jenis kerja yang juruinformatik lakukan? Jelaskan jawapan anda dalam konteks apa yang mereka lakukan "dalam" atau "untuk" **dua** (**2**) bidang berikut:

- Perniagaan
- Masyarakat
- Kesihatan

(35/100)

2. (a) Ramai yang percaya Data Besar adalah satu fenomena yang baru dan jumlahnya amat besar! Anda pula bagaimana? Bagaimanakah akan anda terangkan Data Besar? Terangkan menggunakan contoh.

(40/100)

(b) Kod Etika dan Kelakuan Profesional Kejuruteraan Perisian (SECEPP) merupakan salah satu Kod Kelakuan (CoCs) yang memberi panduan kepada profesional informatik dan juruinformatik dalam "peraturan kendiri" dan pembuatan keputusan secara bertanggungjawab. Kes Acme Co. vs ERP Systems Integrators di bawah adalah salah satu kes di mana Kod tersebut digunakan untuk menyelesaikan konflik. Pertimbangkan kes tersebut.

"Acme Co. menerima arahan dari syarikat induk yang mengarahkan penggantian sistem legasi gaji dan kakitangan dengan pakej perisian ERP khusus yang direka untuk menyelaraskan pemprosesan gaji dan kakitangan yang menyeluruh. Atas cadangan vendor "pakar yang dirujuk", Acme Co. mengkontrak ERP Systems Integrators untuk melaksanakan sistem baru dan menukar data legasi dengan harga $1 juta.

Garis masa kontrak adalah enam bulan, mulai bulan Julai dan diakhiri dengan penukaran "besar-besaran" pada penghujung Disember. Penukaran akhir tahun tersebut gagal, kononnya disebabkan oleh amalan pemindahan data yang lemah oleh ERP Systems Integrators, dan Acme Co. terpaksa menjalankan sistem lama dan baru secara selari — keadaan yang kompleks dan mahal yang telah dirancang dengan teliti agar dielakkan dan ERP Systems Integrators sendiri telah meyakin mereka ianya tidak akan berlaku. Apabila penukaran sistem ditolak ke bulan April tahun berikutnya, Acme Co. melewatkan dan kemudian berhenti membayar invois ERP Systems Integrators. Pada bulan Julai, ERP Systems Integrators telah menarik keluar pasukan pelaksanaannya dan Acme Co. memulakan proses timbangtara.

Kebanyakan projek IT tertakluk kepada kontrak yang memperuntukkan tanggungjawab kepada setiap pihak dan memberi pemulihan khusus untuk pelaksanaan projek yang tertangguh atau gagal. Kontrak tersebut memerlukan pihak-pihak terlibat untuk patuh kepada ikatan timbangtara sulit untuk menyelesaikan pertikaian. Proses (timbangtara) berbeza sedikit daripada litigasi sivil di mahkamah. Walau bagaimanapun, penggunaan CoCs sama terpakai kepada kedua-dua proses.

Hampir setahun berlalu sebelum pembicaraan timbangtara. Sementara itu, saksi-saksi yang disingkir dari Acme Co. dan ERP Systems Integrators, dan pakar-pakar meneliti bahan-bahan jualan, artifak projek (e-mel, laporan status, pelan-pelan projek dan sebagainya), dokumen kontrak, perisian aplikasi, alat-alat migrasi dan kandungan persekitaran pelaksanaan berkongsi-sama."

Dipetik daripada: P. Aiken, R.M. Stanley, J. Billings, L. Anderson (2010), “Using Codes of Conduct to Resolve Legal Disputes”, IEEE Computer, Vol. 43, NO. 4, pp. 29-34.

(i) Apakah **tiga** (**3**) isu pertikaian utama yang perlu diselesaikan?

(30/100)

(ii) Apakah keputusan yang dicapai oleh panel penimbangtara? Setujukah anda dengan mereka, mengapa?

(15/100)

(iii) Apakah impak kes ini terhadap profesyen IT dan komuniti pembangunan/ vendor IT

(15/100)

3. (a) Bandingkan pengurusan maklumat dan pengurusan pengetahuan.

(30/100)

(b) Bagaimana anda mengubah sistem pengurusan maklumat menjadi sistem pengurusan pengetahuan? Bincangkan dengan menggunakan contoh satu informatik artifak/sistem dalam bidang pilihan anda (Informatik Perniagaan, Informatik Sosial, Informatik Bioperubatan, Ekoinformatik atau Geoinformatik).

(40/100)

(c) Kenal pasti sekurang-kurangnya **tiga (3)** cabaran yang mungkin anda hadapi dalam menjalankan transformasi dalam (b). Bincangkan secara ringkas setiap satu daripada mereka

(30/100)

4. Frank Briggs adalah seorang saintis muda berkelulusan PhD yang bijak dan memiliki paten untuk algoritma baru yang boleh meramal permulaan awal penyakit strok melalui pemantauan gelombang otak pesakit. Beliau sangat yakin dengan nilai idea beliau dan ingin mengkomersialkannya. Beliau telah menjual keretanya, meminjam wang daripada keluarga dan mendapatkan pinjaman yang besar. Namun, beliau muflis walaupun para doktor tertarik dengan prototaip yang ditunjukkan oleh Frank.

(a) Apakah yang silap? Bincangkan melalui perspektif pengurusan proses inovasi.

(30/100)

(b) Cadangkan bagaimana Frank boleh mengelak dari kesilapan yang sama. Bincangkan melalui perspektif pengurusan proses inovasi.

(30/100)

(c) Apakah corak model perniagaan yang sesuai untuk membolehkan Frank memulakan perniagaan baru? Gunakan corak model perniagaan oleh Alex Osterwalder dalam perbincangan anda.

(40/100)